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**TRANSMITTAL  
FORM**

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission

Application Number	10/763,514
Filing Date	1-22-04
First Named Inventor	Susan G. Yan
Art Unit	1745
Examiner Name	Ben Lewis
Attorney Docket Number	GP-303570

**ENCLOSURES (Check all that apply)**

- |   |   |  |
|---|---|--|
| <input type="checkbox"/> Fee Transmittal Form                             | <input type="checkbox"/> Drawing(s)                                       | <input type="checkbox"/> After Allowance Communication to TC                                       |
| <input checked="" type="checkbox"/> Fee Attached                          | <input type="checkbox"/> Licensing-related Papers                         | <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences                |
| <input type="checkbox"/> Amendment/Reply                                  | <input type="checkbox"/> Petition   | <input checked="" type="checkbox"/> Appeal Communication to TC (Appeal Notice, Brief, Reply Brief) |
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| <input type="checkbox"/> Affidavits/declaration(s)                        | <input type="checkbox"/> Power of Attorney, Revocation                    | <input type="checkbox"/> Status Letter   |
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**Remarks**

Applicant believes sufficient fees are enclosed for the attached filing, however, should additional fees be due in order to prevent the abandonment of this application, please consider this as authorization to charge Deposit Account No. 070960 (General Motors Corporation) for any such fees due. A duplicate copy of this document is enclosed for this purpose.

**SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT**

Firm Name	Warn, Hoffmann, Miller & Ozga, P.C.		
Signature			
Printed name	John A. Miller		
Date	2-28-07	Reg. No.	34985

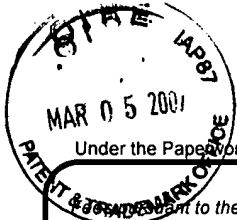
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Signature			
Typed or printed name	John A. Miller - Reg. No. 34985	Date	2-28-07

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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**FEE TRANSMITTAL**  
**For FY 2006**☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$) \$500

**Complete if Known**

Application Number 10/763,514

Filing Date 1-22-04

First Named Inventor Susan G. Yan

Examiner Name Ben Lewis

Art Unit 1745

Attorney Docket No. GP-303570

**METHOD OF PAYMENT (check all that apply)**☐ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify):☒ Deposit Account Deposit Account Number: 070960 Deposit Account Name: General Motors Corporation

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

☒ Charge fee(s) indicated below☐ Charge fee(s) indicated below, except for the filing fee☒ Charge any additional fee(s) or underpayments of fee(s) under 37 CFR 1.16 and 1.17☒ Credit any overpayments**WARNING:** Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.**FEE CALCULATION (All the fees below are due upon filing or may be subject to a surcharge.)****1. BASIC FILING, SEARCH, AND EXAMINATION FEES**

Application Type	FILING FEES		SEARCH FEES		EXAMINATION FEES		Fees Paid (\$)
	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	
Utility	300	150	500	250	200	100	
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

**2. EXCESS CLAIM FEES****Fee Description**

Each claim over 20 (including Reissues)

Fee (\$)

Small Entity Fee (\$)

50 25

Each independent claim over 3 (including Reissues)

200 100

Multiple dependent claims

360 180

**Total Claims****Extra Claims****Fee (\$)****Fee Paid (\$)****Multiple Dependent Claims****Fee (\$)****Fee Paid (\$)**

- 20 or HP =

x

=

HP = highest number of total claims paid for, if greater than 20.

**Indep. Claims****Extra Claims****Fee (\$)****Fee Paid (\$)**

- 3 or HP =

x

=

HP = highest number of independent claims paid for, if greater than 3.

**3. APPLICATION SIZE FEE**

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

**Total Sheets****Extra Sheets****Number of each additional 50 or fraction thereof****Fee (\$)****Fee Paid (\$)**

- 100 =

/ 50 =

(round up to a whole number) x

=

**4. OTHER FEE(S)**

Non-English Specification, \$130 fee (no small entity discount)

**Fees Paid (\$)**

Other (e.g., late filing surcharge): Appeal Brief filing fees

\$500

**SUBMITTED BY**

Signature		Registration No. (Attorney/Agent) 34985	Telephone (248) 364-4300
Name (Print/Type)	John A. Miller		Date 2-28-07

This collection of information is required by 37 CFR 1.136. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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**PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Application No.: 10/763,514  
Filing Date: January 22, 2004  
Applicant: Susan G. Yan et al.  
Group Art Unit: 1745  
Examiner: Ben Lewis  
Title: DURABLE MEMBRANE ELECTRODE ASSEMBLY  
CATALYST COATED DIFFUSION MEDIA WITH NO  
LAMINATION TO MEMBRANE  
Attorney Docket: GP-303570

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**APPELLANT'S APPEAL BRIEF**

This is Appellant's Appeal Brief filed in accordance with 37 CFR § 41.37 appealing the Examiner's Final Office Action mailed November 1, 2006. Appellant's filed their Notice of Appeal, pursuant to 37 CFR § 41.31, on January 31, 2007. The Appeal Brief fee pursuant to 37 CFR § 41.20(b)(2) is enclosed.

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**I. Real Party in Interest**

The real party in interest for this appeal is the General Motors Corporation of Detroit, Michigan, the assignee of the application.

**II. Related Appeals and Interferences**

There are no related appeals or interferences.

**III. Status of the Claims**

Claims 15-18 are pending in this application. Claims 15-18 are on appeal. Claims 1-14 and 19 were cancelled by amendment filed on January 17, 2006. No claims are allowed. No claims are objected to.

Claims 15-18 stand rejected under 35 USC §112, first paragraph, as failing to comply with the enablement requirement, and claims 15-18 stand rejected under 35 USC §103(a) as being unpatentable over U.S. Patent No. 6,444,341 issued to Yen et al. (hereinafter Yen) in view of U.S. Patent No. 6,893,763 issued to Fan et al. (hereinafter Fan).

**IV. Status of Amendments**

All amendments have been entered.

**V. Summary of Claimed Subject Matter**

Independent method claim 15 claims a method for making a membrane electrode assembly (MEA), such as the MEA 10 shown in figure 1. The MEA 10 includes an anode side 12 and a cathode side 14 separated by a polymer electrolyte proton conducting membrane 16. The claimed method includes providing a cathode side

diffusion media layer 26, depositing a cathode side catalyst layer 30 on the cathode side diffusion media layer 26, and spraying an ionomer layer 32 on the cathode side catalyst layer 30. The claimed method also includes providing an anode side diffusion media layer 18, depositing an anode side catalyst layer 22 on the anode side diffusion media layer 18, and spraying an ionomer layer 24 on the anode side catalyst layer 24. The diffusion media layers 18 and 26 are then positioned at opposite sides of the membrane 16 so that the ionomer layers 24 and 32 face the membrane 16.

Independent claim 15 also claims that the diffusion media layers 18 and 26, including the catalyst layers, are bonded to the membrane 16 through operation of the fuel cell so that the diffusion media layers 18 and 26 do not need to be bonded to the membrane 16 prior to operating the fuel cell. Because it is the operation of the fuel cell that bonds the diffusion media layers to the membrane, prior bonding steps for bonding the diffusion media layers to the membrane, typically including hot-pressing, are not necessary, which increases the life of the MEAs in the fuel cell stack, as discussed in paragraphs [0023] and [0026]. Particularly, by not using a hot-pressing step prior to assembly of the fuel cell stack, the MEA is less likely to fail along the outer edge of the catalyst as a result of the edge of the catalyst being pressed to the diffusion media layers during the hot-pressing step.

## **VI. Grounds of Rejection to be Reviewed on Appeal**

Whether claims 15-18 should be rejected under 35 USC §112, first paragraph, for lack of enablement; and

Whether claims 15-18 should be rejected under 35 USC §103(a) as being unpatentable over Yen in view of Fan.

**VII. Argument****A. The Final Office Action was Premature**

Appellant respectfully submits that the Final Office Action was premature and should have been withdrawn. MPEP 706.07(a) states, “[t]he second or any subsequent actions on the merits shall be final, except where the Examiner introduces a new ground of rejection that is neither necessitated by Appellant’s amendment of the claims nor based on information submitted in an Information Disclosure Statement . . .” In Appellant’s Response filed August 8, 2006 that initiated the final rejection, Appellant did not amend the claims. Further, no Information Disclosure Statement was filed. Therefore, Appellant submits that the Final Office Action should have been withdrawn because the §112, first paragraph, rejection is a new rejection that is not necessitated by Appellant’s amendment of the claims nor based on information submitted in an Information Disclosure Statement.

The Examiner mailed the Advisory Action on January 24, 2007 without addressing Appellant’s argument that the Final Office Action was premature.

**B. The specification and claims satisfy the enablement requirement**

It appears to be the Examiner’s position that a fuel cell having a diffusion media and membrane that are not bonded prior to operation of the fuel cell would cause the fuel cell to be inoperable.

MPEP 2164 states, “in order to satisfy the enablement requirement of §112, first paragraph, the specification must describe to one skilled in the art how to make and use the invention.” MPEP 2164.03 gives the test for enablement, particularly, that the specification must describe to one of skill in the art how to make and use the invention without undue experimentation.



Independent claim 15 claims a method for making an MEA for a fuel cell. One of ordinary skill in the art would understand that the fuel cell is an assembly of components, such as flow field plates, membrane, diffusion media layers, spacers, etc. One of ordinary skill in the art would also understand that typically a fuel cell is part of a fuel cell stack that includes bipolar plates separating the fuel cells, end plates, flow manifolds, etc. One of ordinary skill in the art would also understand that various techniques are known in the art to hold the several layers of the fuel cell and/or fuel cell stack together around their edges, such as frames, gaskets, etc.

Therefore, Appellant submits that it would not matter whether the diffusion media layers are bonded to the membrane or not prior to operation of the fuel cell, because the edges of the diffusion media layers and membrane would be held together by a frame or gasket assembly that held the entire fuel cell or fuel cell stack together. Thus, Appellant respectfully submits that the specification is enabled because one of ordinary skill in the art would recognize how the diffusion media layers and the membranes are held together prior to operation of the fuel cell that then caused them to be bonded as Appellant has previously discussed. It is therefore respectfully requested that the §112, first paragraph, rejection be withdrawn.

**C. Claims 15-18 are not obvious in view of Yen and Fan**

1. *Prima facie* obviousness

MPEP 2143 states that in order to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference(s) must teach or suggest all of the claim limitations. Appellant submits that

the Examiner has not established a *prima facie* case of obviousness for at least the reason that the references do not teach or suggest all of the claim limitations.

2. Yen

Yen discloses a polymer electrolyte membrane assembly for a fuel cell that includes depositing a catalyst on a carbon paper electrode, coating the electrode with a liquid electrolyte polymer and bonding the electrode to an electrolyte membrane by a hot-pressing operation (column 6, lines 24-26 and 48-67). All of the examples discussed in Yen include the hot-pressing step to bond the catalyst to the membrane.

3. Fan

Fan discloses applying a catalyst including an ionomer directly to a membrane, then assembling the membrane electrode assembly including the catalyst deposited membrane and gas diffusion media layers. Fan states, “[b]ecause the catalyst ink is directly deposited on the membrane, no hot-press is necessary to fabricate the membrane electrode assembly (MEA).” (Column 5, lines 4-6).

4. Discussion

Appellant submits that Yen does not teach or suggest depositing a catalyst layer on a diffusion media layer, spraying an ionomer layer on the catalyst layer and then forming the diffusion media layer including the catalyst to a membrane through the operation of the fuel cell. Contrary, Yen teaches depositing the catalyst on the diffusion media, and then forming the electrode including the catalyst to the membrane by a hot-pressing step. Yen does disclose depositing a catalyst layer on a diffusion media layer and may teach spraying an ionomer layer on the catalyst layer, but clearly does not teach or suggest forming the diffusion media layer to the membrane through operation of the fuel cell.

Fan only teaches depositing the catalyst directly on the membrane, and not on the diffusion media. In Appellant's invention, the catalyst is applied to the diffusion media layer, and then the diffusion media layer is bonded to the membrane through operation of the fuel cell. Appellant submits that Fan does not teach bonding the diffusion media layers to the membrane because this would not be required in the Fan method because the catalyst is already on the membrane, and not on the diffusion media layer. Fan shows a sub-gasket 16 and 17 between the catalyst layers 14 and 15 and the diffusion media layers, clearly showing that the diffusion media layers are not bonded to the membrane.

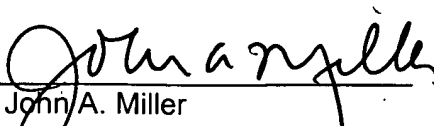
Appellant submits that the Examiner has not established a *prima facie* case of obviousness for at least the reason that the references do not teach or suggest all of the claim limitations, particularly, forming the diffusion media layer to the membrane through operation of the fuel cell.

### VIII. Conclusion

Appellant respectfully submits that for at least the reasons given above, the §112, first paragraph, rejection and the §103(a) rejection of claims 15-18 should be withdrawn. Therefore it is respectfully request that these rejections be reversed.

Respectfully submitted,

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CLAIMS APPENDIX

**COPY OF CLAIMS INVOLVED IN THE APPEAL**

15. A method for making a membrane electrode assembly (MEA) for a fuel cell, said method comprising:

- providing a cathode side diffusion media layer;
- depositing a cathode side catalyst layer on the cathode side diffusion media layer;
- spraying an ionomer layer on the cathode side catalyst layer; and
- providing an anode side diffusion media layer;
- depositing an anode side catalyst layer on the anode side diffusion media layer;
- spraying an ionomer layer on the anode side catalyst layer;
- positioning the diffusion media layers at opposite sides of a membrane so that the ionomer layers faces the membrane; and
- operating the fuel cell to cause the diffusion media layers to form to the membrane so that the diffusion media layers do not need to be bonded to the membrane prior to operating the fuel cell.

16. The method according to claim 15 wherein depositing the catalyst layers on the diffusion media layers includes depositing the catalyst layers so that they are about the same size as the diffusion media layers.

17. The method according to claim 15 further comprising providing a microporous layer as part of the diffusion media layers, where the catalyst layers are deposited on the microporous layer.

18. The method according to claim 15 wherein the membrane is a perfluorinated membrane.

EVIDENCE APPENDIX

There is no evidence pursuant to §1.130, §1.131 or §1.132.

RELATED PROCEEDINGS APPENDIX

There are no decisions rendered by a court or the Board in any proceeding identified in Section II of this Appeal Brief.